

ABSTRACT OF THE DISCLOSURE

A III-V nitride, e.g., GaN, substrate including a (0001) surface offcut from the $\langle 0001 \rangle$ direction predominantly toward a direction selected from the group consisting of $\langle 10\text{-}10 \rangle$ and $\langle 11\text{-}20 \rangle$ directions, at an offcut angle in a range that is from about 0.2 to about 10 degrees, wherein the surface has a RMS roughness measured by $50 \times 50 \mu\text{m}^2$ AFM scan that is less than 1 nm, and a dislocation density that is less than $3\text{E}6 \text{ cm}^{-2}$. The substrate may be formed by offcut slicing of a corresponding boule or wafer blank, by offcut lapping or growth of the substrate body on a corresponding vicinal heteroepitaxial substrate, e.g., of offcut sapphire. The substrate is usefully employed for homoepitaxial deposition in the fabrication of III-V nitride-based microelectronic and opto-electronic devices.